meanderings

The Newsletter of the New Hampshire Rivers Management and Protection Program

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The Ammonoosuc — Destined for Designation

In March of 2006, a group known as the Ammonoosuc Corridor Advisory Committee and the town of Littleton nominated a 44.8 mile segment of the Ammonoosuc River for designation into the New Hampshire Rivers Management and Protection Program (RMPP). During the two-year-long nomination process, no one or no group opposed the nomination. In fact, 33 letters of public support were submitted with the nomination to DES. The Rivers Management and Advisory Committee (RMAC) and DES reviewed and approved the nomination and in January of 2007, DES forwarded the nomination to the legislature in the Report to the General Court. House Bill 61, nominating segments of the Ammonoosuc River into the RMPP passed on February 21, 2007 with unanimous support from the Resources, Recreation and Development Committee. Next stop for the nomination is the NH Senate.

The Ammonoosuc River is located in northwestern New Hampshire in the upper Connecticut River watershed. It begins at Lake of the Clouds on the western slopes of Mount Washington and flows west, north and southwest for 60 miles through the communities of Carroll, Bethlehem, Littleton,

Ammonoosuc, *continued on page 4*

Progress on Instream Flow Protection

Since the passage of the Rivers Management and Protection Act (RSA 483) in 1990, New Hampshire has struggled to implement the methodology needed to implement protected instream flows for the state's designated rivers. RSA 483:9-c requires protected instream flows be "established and enforced to maintain water for instream public uses and to protect the resources for which the river or segment is designated." The "watershed" event that began the process occurred in 2002 when a broad based coalition of New Hampshire business and conservation interests joined together to enact compromise legislation, Chapter 278, Laws of 2002, that initiated the pilot program for instream flow protection on two of the state's 14 designated rivers – the Lamprey River in the coastal watershed and the Souhegan River in the Merrimack watershed.

In addition to initiating the state's responsibility to develop and implement protected instream flows on designated rivers, Chapter 278 also makes a clear distinction between policy and science. It established two committees to advise the Department of Environmental Services: a Technical Review Committee (TRC) to focus on science and a Water Management Protection Area Advisory Committee (WMPAAC) to focus on policy. The TRC is made up of water and watershed management professionals from business, conservation, and government agencies to provide DES with technical direction, feedback, and information toward development of the Protected Instream Flow (PISF). The WMPAAC is made up of people representing the knowledge and interests within the watershed. Their role is to advise and assist DES regarding public concerns and river conditions focusing mainly on the Water Management Plan (WMP).

Scenic vista of the Souhegan river from Route 101, with swimmers under bridge.

Once the 2002 legislation started the process, administrative rules were required to provide the details needed to implement the

Instream Flow Protection, *continued on page 4*

From the Bend in the River

Comments from the Rivers Coordinator

RSA 483, the enabling statute of the Rivers Management and Protection Program (RMPP), created a state and local partnership that enables New Hampshire and its communities to designate river corridors with outstanding characteristics and values. Once a river is designated under RSA 483, it benefits from state level activities such as instream flow protection and coordinated technical and financial assistance to Local River Management Advisory Committees (LACs), while local level activities include management plan development and implementation as well as advisory comments at the municipal and state level. Since the 2004 publication of *Meanderings*, the RMPP experienced steady progress at the state and local level.

At the state level, progress has continued with the Instream Flow Pilot projects on the Souhegan and Lamprey Rivers (see page 1). The significance of the pilot projects can not be overstated: since the passage of RSA 483 in 1988, New Hampshire has been grappling with how to implement protected flows on designated rivers. Due to the buy in and support of business, municipal and conservation interests, the pilot programs were initiated in 2003 and have collected physical, biological, chemical, and water use data that will help set protected flows. It is anticipated that protected instream flows will be set for the Souhegan and possibly the Lamprey in 2007 – a true watershed event for the RMPP and New Hampshire!

Other activities facilitated by the RMPP staff include administration of the Protected River Sign program (see page 10) as well as Water Quality Planning and Implementation grants to the Regional Planning Commissions and the Connecticut River Joint Commissions to assist in the development and implementation of Local River Corridor Management Plans (see page 8). Both efforts reflect the state local partnership embodied within the RMPP: local level initiatives, such as outreach and awareness through protected river signs and/or planning through management plan development, supported via funding, coordination, technical support and administration at the state level.

At the local level, the LACs' accomplishments are impressive. The LACs, who are New Hampshire's only locally nominated and DES appointed advisory committee, have a duty to develop and implement river corridor management plans. These plans, per RSA 483:10, can be adopted as part of a community's master plan and as such provide a unique opportunity for resource-based planning that goes beyond municipal boundaries yet is still considered at the local level. Since 2004, the Souhegan River LAC adopted its Watershed Management Plan and the Ashuelot River LAC updated its original river corridor management plan (see page 10). This year it is expected that the Upper Merrimack River LAC, Lamprey River LAC, and Lower Merrimack LACs will update their management plans, and the Isinglass River LAC will begin the effort to develop its management plan.

In addition to their management plan efforts, LACs submitted comments on permit applications, conducted water quality monitoring, held river festivals, conducted monthly meetings, published newsletters, coordinated land protection efforts, and commented on legislation and proposed administrative rules. This level of activity speaks to the dedication of the LAC members and the countless volunteer hours they contribute. Thank you Local Advisory Committee members; you are valued stewards of your watersheds and appointed advisers to DES!

The continued success of the RMPP relies on public support and local involvement along riverfront communities. If you are interested in learning more about the RMPP please visit our website at www.des.nh.gov/rivers. If you live in a community through which a designated river flows and you would like to be involved in the river's activities, or if you have an interest in leading or beginning a nomination, please contact DES Rivers Coordinator Steve Couture at 271-8801 or scouture@des.state.nh.us for further information.

~ Steve Couture, Rivers Coordinator

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Long-Awaited Guidelines Published

"We may conclude then that in every respect the valley rules the stream. Its rock determines the availability of ions, its soil, its clay, even its slope." (Hynes, 1975)

The "Guidelines for Naturalized River Channel Design and Bank Stabilization," its accompanying "White Paper: Fluvial Geomorphology and River Restoration" and an electronic library are the results of a four-year collaborative effort funded by the NH Department of Transportation and an US EPA 319 grant administered by DES. This effort, which included thorough review and comment by federal, non-profit, state, and private interests, provides the scientific justification and details current and holistic approaches to the practice of naturalized river channel design and bank stabilization.

The management of river systems has deep historic roots due to persistent human use of this resource for a variety of services such as transportation, food, water, mechanical energy, and waste disposal. These valuable benefits provided by flowing waters brought humans to live very close to the banks of rivers, and thus caused conflicts between humans and natural forces in river corridors and their extended floodplains.

Early ad hoc management of river channels led to more regimented efforts of actions that seemed to always work against natural river processes. The end result is frequently mismanagement cycles where common changes to river corridors actually exacerbate the exact problem that was trying to be avoided. Needless to say, this has led to costly, long-term commitments to managing rivers in addition to increased risk to human investments. In the Northeast, historic changes to river corridors and watersheds have disrupted natural form and processes and often lead to increased channel instability, reduced water quality, and the impairment of aquatic habitat.

The *Guidelines*, its accompanying *White Paper* and the electronic library provide river stakeholders with the latest science and approaches to work with natural river processes and end historic mismanagement cycles while still protecting human investments, channel stability, water quality and aquatic habitat.

In the past several decades, much has been done to improve both theory and application of naturalized river channel design and bank stabilization. The continually growing knowledge in applied local rehabilitation and enhancement, and full system restoration has led to an expanded set of available design procedures and tools. The practitioner can now draw from an expanded toolbox containing a broad range of well established empirical, analog, and analytical design methods.

The *Guidelines* walks the user through different scenarios and considerations – from the planning stages of design to the implementations and funding associated with it and all aspects in between. To address the challenge of selecting appropriate design methods for each unique project – the art associated with the science of naturalized river channel design and bank stabilization – a project classification system is presented that is based on the project goals, scope, physical site constraints, ecological risks, and likely level of societal acceptance. Classification of a project as routine, moderate, or comprehensive informs the planning process, guides selection of design methods, supports project implementation, and increases the chances for meeting goals and objectives.

River corridors and their watersheds are integrally linked, as embodied in the above statement by H.B. Hynes, "the father of running water ecology." Furthermore, the interrelated physical, chemical, and biological components of aquatic ecosystems are a function of their valley position and watershed condition. Rivers transport water and sediment in a dynamic equilibrium (Lane, 1955) from erosional headwaters, through mid-order transfer zones, to downstream locations where sediment is deposited. The understanding of the most likely states in river patterns and processes via the study of fluvial geomorphology has led to a multitude of ways to measure and classify channels. This discipline is rapidly expanding as researchers and practitioners look to further understand a river's most probable state and use this information to more effectively manage flowing waters at appropriate spatial and temporal scales.

Ammonoosuc River.

Guidelines, *continued on back page*

Instream Flow Protection

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pilot programs. To determine the best way to proceed, DES, with the advice and input of the Rivers Management Advisory Committee (RMAC), developed and adopted the Instream Flow Rules that apply to the Souhegan and Lamprey Rivers. DES's Instream Flow Rules, Env-Ws 1900, describe the process for conducting a protected instream flow study and developing a water management plan to implement the study results. The rules specifically identify what is to be protected and how the process of determining the protected flows will happen.

Each PISF study requires intensive data collection and analysis of a river's hydrology, fishery, groundwater, aquatic habitat and other factors. A consultant was selected to identify the characteristics and resources needing protection and the flows that will enable them to be protected. The framework for balancing flow needs with water use is the Natural Flow Paradigm (see page 8 for more details), which provides protective measures that replicate to the extent possible, the natural variation in flows for low to high flow conditions. With this conceptual model in hand the Souhegan River pilot project has made the most progress. The Souhegan TRC held 11 meetings to evaluate the PISF processes and the resulting protected instream flow values. This extensive effort culminated with a DES public hearing on March 21, 2007 in Milford to review the report describing the process and the proposed protected flows. Upon receipt of comments and when the final revisions have been made, DES will establish New Hampshire's first protected instream flows for a designated river!

Once the PISF is established for the Souhegan, the Water Management Plan will need to be developed to implement its protection measures. The three main areas of water management for protected flows – conservation, water use, and dam operations – will be looked at and combined to form the water management plan. This will include identifying specific methods to reduce water use to address conservation, and identifying and evaluating water distribution and storage options to develop the water use component of the WMP. Evaluation of options for the storage and release of water from behind dam impoundments will be used to develop the dam operations component of the WMP.

With this assessment in hand, the WMPAAC will assist in developing a water management plan that maintains the protected flows by selecting the most effective and least intrusive alternatives. The committees will review and comment on the available alternatives more than once before the proposed water management plan goes before the public. After the water management plan is presented to the public for comment, it will be revised accordingly and DES will adopt it and begin implementation of the plan.

The Instream Flow Program has taken many years to reach this point. The pilot program exists because of the cooperation of many people with differing interests who all saw the value of protecting New Hampshire's rivers. DES looks forward to continued partnerships, participation and progress on the Souhegan and Lamprey PISF pilot projects in 2008!

~ Wayne Ives, DES Instream Flow Specialist

Ammonoosuc

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Lisbon, Landaff and Bath until it reaches its confluence with the Connecticut River at Woodsville in the town of Haverhill. As proposed by the nominating organizations, the designation would begin from the White Mountain National Forest boundary near Lower Falls in Carroll and continue until it reaches its confluence with the Connecticut River in Haverhill.

A number of river-related values and characteristics qualify the Ammonoosuc River for designation into the RMPP. Encircled by the natural beauty of the area, residents and tourists enjoy swimming, fishing, camping, hiking, hunting, photographing, picnicking, and canoeing. Woodsville Precinct gets its drinking water directly from the river and the town of Lisbon obtains its drinking water from gravel packed wells located right on the river's edge. However, the Ammonoosuc River Valley is currently in the middle of a development boom and there is growing concern about the impact these changes and the resulting fragmentation might have on water quality, wildlife, stream bank erosion rates, access, and the quality of the recreational experience on the river.

Ammonoosuc River in Bath Village.

For more specifics on the Ammonoosuc River Nomination, please visit www.des.nh.gov/rivers/nominations.htm.

~ Laura Hayes, RMPP Assistant Planner

Update from the Rivers Management Advisory Committee

The Rivers Management Advisory Committee (RMAC) is the legislatively created body charged to work with DES on the administration of RSA 483, the Rivers Management and Protection Act. The Governor and Council appointed committee is comprised of members from the business, agriculture, hydroelectric, municipal government, water supply, conservation, recreation, Fish and Game, and historical interests. The committee is comprised of 14 members, ten voting and four non-voting. The RMAC's principle duties are to review nominations to designate rivers into the Rivers Management and Protection Program (RMPP), to oversee the disposal of state lands within river corridors, and advise DES regarding the implementation of the RMPP.

After a long hiatus, a new river was nominated for designation into the RMPP. The Ammonoosuc Corridor Advisory Committee and the town of Littleton brought forth an excellent nomination that included strong support of all seven corridor communities. The RMAC reviewed the nomination, hosted a well attended public hearing in Littleton, and recommended the nomination move forward for General Court approval. See page 1 for full story.

The RMAC commented on 2006 legislation pertaining to the spreading of biosolids at grandfathered sites within designated river corridors, which sunsets in 2007. Although the 2006 legislation was rejected, the RMAC followed through by requesting 2007 legislation that these sites be allowed to continue, but no new sites would be permitted. This request was fulfilled and HB 812 is currently being considered by the General Court.

In 2006, the RMAC provided testimony on HB 1495 relative to setback requirements for landfills located near rivers and submitted a white paper to the Comprehensive Shoreland Protection Act (CSPA) Commission. The white paper included a list of prioritized recommended changes to strengthen the protection of the state's designated rivers. The RMAC also testified on the content of the white paper to the CSPA Commission.

In early 2007, the RMAC requested legislation to change the membership of the RMAC, extend watershed management to local and state level management plans, and other technical changes to the Rivers Management and Protection Program. House Bill 722 proposes adding one voting and one non-voting member to the RMAC, a representative from the NH Department of Transportation and a representative from the Local River Management Advisory Committee (LRMAC). This legislation also seeks to include the tributary areas for Long-Range River Management Plans and River Corridor Management Plans to allow state and local management plan efforts to use a watershed approach. The science of watershed management is well established and its use would further both state and local efforts to properly manage and protect our state's designated rivers.

The loss of stream gages that measure instream flow, mainly due to loss of funding, is of prime concern to the RMAC. Stream gages monitor stream flow and its variation over time. This monitoring is fundamental to understanding and managing water resources to meet multiple objectives. Per its advisory duty under RSA 483:8 V, the RMAC developed a set of recommendations and a strategy to establish a Stream Gage Task Force. The DES Commissioner convened the the task force in 2006 comprised of representatives from DES, the RMAC, the US Geological Survey, the University of New Hampshire, Plymouth State University, the Lakes Management Advisory Committee (LMAC), and the Legislature. The task force met three times in 2006 to address the reduction of gages, evaluate the location of gages, analyze the interaction between the state and the USGS program, and establish a long-term dedicated revenue stream for the program. The task force identified gaps in the stream gaging network by ranking all existing gages and prioritizing new gages to be added. The task force determined that 17 gages need to be added and a funding mechanism needs to be developed to implement this network. The DES commissioner sent these recommendations to the legislative Water Resources Study Committee as established by SB 162 (2003 Session) for its consideration. The RMAC will continue to work with DES and others to find funding and partnership mechanisms to implement the task force's report, *A strategy to implement and fund a long-*

The Ammonoosuc Corridor Advisory Committee and the town of Littleton brought forth an excellent nomination that included strong support of all seven corridor communities. The RMAC reviewed the nomination and hosted a well attended public hearing in Littleton (pictured here), which helped move the nomination forward.

RMAC, *continued on back page*

The Comprehensive Shoreland Protection Act Revisited

The Comprehensive Shoreland Protection Act (CSPA), RSA 483-B was enacted by the New Hampshire General Court in 1991 recognizing that "the shorelands of the state are among its most valuable and fragile natural resources and their protection is essential to maintain the integrity of public waters" and that "the public waters of New Hampshire are valuable resources held in trust by the state. The state has an interest in protecting those waters and has the jurisdiction to control the use of the public waters and the adjacent shoreland for the greatest public benefit."

Senate Bill 83, Chapter 208, Laws of 2005 "established a commission to study the effectiveness of the comprehensive shoreland protection act and to explore standards that are better suited to local and state resource needs and to preservation of the public waters of the state." The commission was comprised of 24 members representing a variety of stakeholders including the General Court, the conservation community, the regulatory community, natural resource scientists, agricultural interests, business and economic interests, and members of the general public. The commission was tasked with producing a report with findings and recommendations to the Legislature. The commission met on a monthly basis to review the effectiveness of the standards and regulatory processes established under the CSPA, identifying areas in need of revision or clarification, and exploring funding options for the implementation of the Shoreland Program by DES.

Various lake and river organizations including the New Hampshire Rivers Council, NH Rivers Management Advisory Committee, Ashuelot River Local Advisory Committee, Connecticut River Joint Commissions Inc., Pemigewasset River Local Advisory Committee, Lamprey River Advisory Committee, Exeter River Local Advisory Committee, NH Lakes Management Advisory Committee, New Hampshire Lakes Association, New Hampshire Marine Trades Association, and the NH Fish and Game Department submitted white papers to the commission on the merits and shortcomings of the CSPA. The commission also listened to experts testify on imperviousness and discussed the feasibility of establishing a permit program.

After reviewing the various standards established by the CSPA, in conjunction with trends in shoreline development and water quality, the commission found that "the CSPA in its current form does not offer adequate protection to the state's surface waters and shorelands. The natural, vegetated buffers within the protected shoreland continue to be lost or degraded, putting surface water quality at increased risk. This degradation in water quality adversely impacts human use and value, as well as the ecological value of surface waters." The commission submitted a list of 17 recommendations, which can be found in the *Final Report of the Commission to Review the Effectiveness of the Comprehensive Shoreland Protection Act*. A copy of the report is available on-line at www.des.nh.gov/cspa/CSPACommissionReport/final_report11-28-06.pdf. The specific recommendations relative to rivers include providing the same level of protection for all designated rivers by removing the exemption in the CSPA for the Saco and Pemigewasset Rivers, updating the methodology used to determine stream order to a more common used approach that includes both perennial and intermittent streams, and expanding the provisions of the CSPA to include third order streams.

Representative Judith Spang sponsored four bills to implement the recommendations put forth by the Commission. HB 663 is an act making an appropriation to implement the comprehensive shoreland protection act. HB 665 modifies the applicability of the comprehensive shoreland protection act by removing the exemption for the Pemigewasset River and Saco River and expanding the provisions of the CSPA to include third order streams. HB 857 is an act that clarifies permitting responsibilities under the comprehensive shoreland protection act and grants the department of environmental services sole authority to issue waivers and variances. HB 383 is an act that adds a waterfront buffer requirement and modifies the natural woodland buffer requirement of the comprehensive shoreland protection act. More information on these bills can be found on-line at www.gencourt.state.nh.us/ie/billstatus/quickbill.html.

The intent of all four bills is to strengthen and/or clarify the existing provisions of the Comprehensive Shoreland Protection Act. The proposed changes would further the intent of RSA 483, the Rivers Management and Protection Program by providing consistent protection for all designated rivers. Furthermore, the proposed changes would also further the intent of RSA 483-B, the Comprehensive Shoreland Protection Act by protecting more shorelands, which is essential to maintaining the integrity of public waters.

It will be interesting to see how the CSPA is modified and amended to address the deficiencies identified by the commission. To learn more about the status of the bills or when the next public hearing is scheduled, please contact Steve Couture, Rivers Coordinator, at (603) 271-8801 or scouture@des.state.nh.us.

~ Darlene Forst, Shoreland Section Supervisor, DES Wetlands Bureau

Weed Woes in the River Flows

When the topic of exotic aquatic plants comes up, most people automatically tend to associate things like milfoil, fanwort, and other species with lakes and ponds. This assumption however, can be quite incorrect, particularly since the reality of the issue is that exotic aquatic plants do very much exist in rivers and streams. Each year we have cataloged new infestations in river segments throughout the state. Currently the Contoocook, Cocheco, Suncook, Merrimack, Connecticut, Nashua and Piscataquag rivers all support exotic aquatic plant infestations.

Eurasian Water-Milfoil, Myriophyllum spicatum. Photo by Amy Smagula, NHDES.

Some of these rivers, including the Cocheco, Merrimack, Suncook, Contoocook and Piscataquag only have one exotic aquatic plant. In each of these, variable milfoil is the problem species. For rivers like the Nashua and the Connecticut, there are many exotic aquatic plants that co-exist. The Nashua River is plagued with infestations of fanwort, variable milfoil, water chestnut and curly-leaf pondweed. The Connecticut River has Eurasian water-milfoil, curly-leaf pondweed and two invasive water naiad species.

The Piscataquag River is one of the most recent rivers to succumb to the impacts of exotic plants. During the summer of 2006, a riparian land owner sent in a fragment of milfoil for identification by DES. The plant was hardy, lush, and green in the river near the landowner's home. DNA analysis verified that the plant was indeed variable milfoil. We suspect that the milfoil in the headwater pond to this river, Scobie Pond (also called Haunted Lake) in Francestown, was the cause of this infestation.

Variable milfoil was found in Scobie Pond in 2003, and quickly began sending fragments around the pond, and downstream over the dam. In one year's time, the rooted infestation in the pond doubled, and then in the next year doubled again, with increasing numbers of fragments floating downstream into the Piscataquog River.

At this point, we are uncertain as to the full extent of the infestation in the Piscataquog River. We do know of points along the river in Goffstown, including in the Glen Lake impoundment, and at the confluence of the Piscataquag and Merrimack Rivers. DES plans to fully map the river from Scobie Pond to the Merrimack River in the summer of 2007, and to develop a long-term management plan for the river and its watershed.

The Piscataquag River is only one example of this rapid spread of exotic aquatic plants. River systems can quickly convey vegetative fragments and seeds from one area to another, resulting in rapid dispersion and colonization of exotic aquatic plants.

DES strongly encourages all groups and individuals working on rivers to begin a regular program, such as the DES Weed Watcher Program, to find and document new and existing infestations of exotic aquatic plants. For more information about Weed Watching, or exotic aquatic plants in general, visit the Exotic Species website at www.des.nh.gov/WMB/ExoticSpecies/, or contact Amy Smagula at (603) 271-2248 or asmagula@des.state.nh.us.

~ Amy P. Smagula, DES Limnologist/Exotic Species Program Coordinator

2007 Watershed Conference

Interest in the annual Watershed Conference has grown tremendously, as reflected by the record number of people who attended the 2006 conference—194 watershed stakeholders! That is why we look forward to another successful conference for 2007, which will be held on Saturday, November 17 from 8 a.m. to 4 p.m. at the New Hampshire Technical Institute in Concord.

The Watershed Conference allows you to join peers from local river management advisory committees, volunteer monitoring groups, lake associations, watershed associations, municipalities, conservation commissions, and non-profits to attend information workshops, exchange innovative river and watershed initiative ideas, view displays from lake and river organizations throughout the state and come away with renewed enthusiasm and a world of knowledge to put toward protecting the aquatic resources you love!

If you missed out on the 2006 conference, you can review its proceedings, as well as those for the 2003 and 2004 conferences, at www.des.nh.gov/WMB/WatershedConference/.

For more information about the 2007 conference, please go to www.des.nh.gov/WMB/WatershedConference/, or contact Laura Weit at (603) 271-8811 or lweit@-des.state.nh.us. We hope to see you there!

~ Laura Weit, RMPP Assistant Planner

The Natural Flow Paradigm

As part of the Rivers Management and Protection Program, RSA 483 requires DES to regulate the quality and quantity of instream flows of designated rivers to conserve and protect outstanding characteristics. These characteristics include: recreation, fisheries, wildlife, environmental, cultural, historical, archaeological, scientific, ecological, aesthetic, community significance, agricultural and public water supplies.

"The ecological integrity of river ecosystems depends on their natural dynamic character"

Developing flow protection for all of these characteristics can be challenging since protection of natural ecosystems alone is a complex problem. Recent flood and drought cycles have shown us that while there is a lot of water it may not be available where and when we would like it. Stream flow quantity fluctuates dramatically over time (within the scale of hours, days, seasons, years, and longer). This flow variation can be very large (orders-of-magnitude) occurring even within the shortest of these time scales. Because of this natural range of variability, deciding what the flow ought to be on any one day is unrealistic. A conceptual framework is necessary to put the daily stream flow needs for the conservation and protection of river characteristics in context with the recent and historical stream flows.

The instream flow pilot projects (on page 1) are based on the Natural Flow Paradigm[1] (NFP). Conceptually, the NFP says that aquatic life is adapted to the stream flow conditions that include the natural flow pattern with its range of high and low flows. This is important because a healthy river will consistently provide temporary and persistent types of habitat. This predictable availability of habitat promotes the evolution of species that can exploit these types of habitat. In addition to shifting habitat, riverine species take cues from seasonal changes. For example, certain high flow conditions trigger spawning, low summer flows allow growth of juveniles, stable winter flows prevent the freezing of hibernating species.

Furthermore, the NFP states that "the key to management of healthy river ecosystems has to revolve around restoring their natural dynamic character." By describing protected flows this way, a low magnitude flow is not seen as a non-supporting event unless it happens more frequently or continues for a longer duration than natural. Protected flows that are identified with NFP components result in more flexibility for water use and in higher levels of ecosystem protection than a single flow magnitude could provide.

~ Wayne Ives, DES Instream Flow Specialist

[1] The Natural Flow Regime: *A paradigm for river conservation and restoration,* N. LeRoy Poff, J. David Allan, Mark B. Bain, James R. Karr, Karen L. Prestegaard, Brian D. Richter, Richard E. Sparks, and Julie C. Stromberg, *BioScience* (Vol. 47, pp. 769-784).

Water Quality Planning and Outreach Programs

Every two years DES receives federal funds under Section 604(b) of the Clean Water Act, which is distributed to regional planning agencies on a competitive basis. In 2005, seven regional planning agencies—Central New Hampshire Regional Planning Commission, Lakes Region Planning Commission, Rockingham Planning Commission, Southwest Region Planning Commission, Strafford Regional Planning Commission, Upper Valley Lake Sunapee Regional Planning Commission, and the Connecticut River Joint Commissions—submitted scopes of works to support local river management advisory committees or in the absence of need of such service, for supporting local watershed planning efforts. All seven proposals were funded for years 2005 and 2006, although some reductions in amounts were necessary to fall within the available $106,000.

Awarded funds were used to accomplish the following projects: revise the Upper Merrimack River Management Plan; provide assistance to the Pemigewasset River Local Advisory Committee; develop and implement public outreach and education programs for the Exeter River; update the Ashuelot River Corridor Management Plan and publish an atlas of the Cold River watershed; develop a series of maps for the Lamprey River Watershed Association; provide assistance to the Sunapee Area Watershed Coalition to develop a management plan; and prepare a revised water quality chapter for the Connecticut River Management Plan.

In 2006, the Nashua Regional, Lakes Region, Rockingham, and Southwest Region planning commissions, North Country Council, and Connecticut River Joint Commissions submitted proposals to implement water quality planning and outreach programs on the Pemigewasset River, Lower Merrimack River, Exeter River, Isinglass River, and the Connecticut River. A total of $80,000 will be distributed as tasks are completed for years 2007 and 2008. The next request for proposals will be circulated to regional planning agencies in June 2008.

~ Laura Weit, RMPP Assistant Planner

The Volunteer River Assessment Program

The New Hampshire Volunteer River Assessment Program was established in 1998 to promote awareness and education of the importance of maintaining water quality in New Hampshire's rivers and streams. VRAP aims to educate people about river and stream water quality and ecology and to improve water quality monitoring coverage for the protection of water resources.

Since 1998, VRAP has loaned water quality monitoring equipment, provided technical support, and facilitated educational programs to volunteer groups on numerous rivers and watersheds throughout the state. VRAP volunteers conduct water quality monitoring on an ongoing basis. The work of the VRAP volunteers increases the amount of river water quality information available to local, state and federal governments, which allows for better watershed planning.

A VRAP volunteer with water quality sampling materials.

Why is VRAP Important?

VRAP establishes a regular volunteer-driven water sampling program to assist DES in evaluating water quality throughout the state. VRAP empowers volunteers with information about the health of New Hampshire's rivers and streams. Regular collection of water quality data allows for early detection of water quality changes allowing DES to trace potential problems to their source. Data collected by VRAP volunteers are directly contributing to New Hampshire's obligations under the federal Clean Water Act. Measurements taken by volunteers are used in assessing the water quality of New Hampshire's river and streams, and are included in reporting to the US Environmental Protection Agency.

Training and Technical Support

VRAP lends and maintains water quality monitoring equipment kits to VRAP groups throughout the state. The kits contain meters and supplies for in-the-field water quality measurements of water temperature, dissolved oxygen, pH, specific conductance (conductivity), and turbidity. Other parameters such as nutrients, metals, and *E. coli* can also be monitored.

Each VRAP volunteer attends an annual training workshop to receive a demonstration of monitoring protocols and sampling techniques. During the training, volunteers have an opportunity for hands-on use of the VRAP equipment and receive instruction in the collection of samples for laboratory analysis.

During the summer months, VRAP receives water quality data from trained volunteers. The data are reviewed for quality assurance, and are entered into the environmental monitoring database at DES. During the off-season, VRAP interprets the data and compiles the results into an annual report for each river. VRAP volunteers can use the data as a means of understanding the details of water quality, as well as guide future sampling efforts. DES can use the data for making surface water quality assessments, provided that the data met certain quality assurance/quality control guidelines.

2006 Program Overview

In 2006, VRAP supported 24 volunteer groups on numerous rivers and watersheds throughout the state. Each year VRAP has continued to grow both in terms of the number of groups participating and the amount of useable data that is collected. During 2006 VRAP worked to continually improve the program both in its ability to collect quality environmental data and the service the program provides to the volunteer groups participating.

In 2006 the VRAP program collected more data and monitored more stations than in any previous year. The program continues to develop and expand, while maintaining the quality assurance/quality control processes that form the core of the program. VRAP volunteers are invaluable in protecting and preserving New Hampshire's rivers and streams and for being local stewards who help education the community regarding the importance of good water quality.

Get Involved!

For more information on VRAP, or becoming a volunteer, call Jen Drociak, VRAP coordinator, at (603) 271-0699 or vrap@des.state.nh.us.

~ Jen Drociak, DES Volunteer River Assessment Program Coordinator

Protected River Signs are Hot!

The NH Rivers Management and Protection Program is proud to announce the launch of the Protected River Sign program. DES in partnership with the NH Department of Transportation has created protected river signs that provide the opportunity to recognize and raise awareness of New Hampshire's Designated Rivers and signify their importance to the state's and municipality's natural and cultural heritage. Signs may be placed anywhere within town lines by the town/city or an appropriate contractor, including bridge crossings of state right-of ways, with the exception of interstate highways, divided portions of the New Hampshire turnpike system, and limited access highways.

This opportunity is available to all local advisory committees and their corridor communities. To date, the Souhegan River LAC, Swift River LAC, Isinglass River LAC, Connecticut River Joint Commissions, and the Piscataquog River LAC have all secured signs for their rivers. In the first year, local advisory committees have installed signs at 24 locations.

Two sets of signs are typically installed at each location, one set facing traffic on either side of the road. The primary sign is placed above the secondary sign on a 12-foot steel post. The primary sign contains the name of the river in white lettering on green background and the secondary sign or NH Protected River sign contains a picture of a covered bridge. The cost for one location is $153.80. DES helped offset that cost in 2006 by receiving a $1,000 grant from the Wal-Mart Stores and Sam's Club.

To purchase protected river signs for a location within a *DOT right-of-way*, please fill out the DOT form available on-line at www.des.nh.gov/Rivers/documents/StateROWSignInstallationPermissionForm2.0.pdf. To purchase protected river signs located within a *municipal right-of-way*, please fill out the municipal form available on-line at www.des.nh.gov/Rivers/documents/MunicipalSignInstallationNotificationForm2.0.pdf. Please submit completed forms to DES.

If you have any questions or need clarification about the program, please contact Laura Weit, Rivers Program assistant planner, at (603) 271-8811 or lweit@des.state.nh.us.

~ Laura Weit, RMPP Assistant Planner

Ashuelot River Corridor Management Plan Updated!

In 2005, the Southwest Regional Planning Commission (SWRPC) was awarded a competitive two-year 604(b) grant to conduct water quality planning activities, including updating Ashuelot River Corridor Management Plan, with the funding for the project provided by the US Environmental Protection Agency and administered by DES. In 2006, the Ashuelot Local River Management Advisory Committee (ARLAC) and SWRPC completed their efforts to update the *Ashuelot River Corridor Management Plan*.

The *Ashuelot River Corridor Management Plan* was first published in 2001. The essence of the plan is to ensure a balance between protection of legitimate community interests and the rights of property owners along the river, in order to protect and improve the existing resource values of the River and its corridor. The plan proposes a management approach with the mission of protecting plentiful clean water, maintaining thriving riparian and aquatic habitat for wild plants and animals, and providing balance for continued development of land use and water uses, recreation, and other public needs.

The update reflects changes in the status of development plans, community plans, and dam removals that have taken place since 2001. It also includes a summary of ARLAC's ongoing Volunteer Water Quality Monitoring Program and refers to *A Land Conservation Plan for the Ashuelot River Watershed* published in 2004 by The Nature Conservancy. *A Land Conservation Plan for the Ashuelot River Watershed* is one of two nation-wide pilot projects that developed a landscape-scale conservation plan and can be found on-line at www.nature.org/wherewework/northamerica/states/newhampshire/files/conservation_plan_final_092704.pdf.

ARLAC is the first local advisory committee to update its river management plan. It has enjoyed great success of getting its original plan adopted by many of the cities and towns located along the river by presenting the *Ashuelot River Corridor Management Plan* to local officials for consideration and asking planning boards to adopt it as an adjunct to the local master plan. It has also encouraged planning boards to integrate recommendations from the plan into local land use planning as they deem appropriate. ARLAC looks forward to achieving the same level of success with the adoption of the updated plan.

The updated plan is available online at www.des.nh.gov/rivers/documents/AshuelotRiverCorridorManagementPlan.pdf. For further information contact Barbara Skuly, ARLAC chair, at (604) 352-0987 or bskuly@earthlink.net.

Cold River Local Advisory Committee 2006 Accomplishments

In 2006, the Cold River Local Advisory Committee (CRLAC) had many accomplishments in municipal conservation, planning, and health assistance; workshops, events and education; and water quality and quantity monitoring.

Under the municipal conservation, planning, and health assistance category the CRLAC received grant funding for their work in the watershed on protection plans for drinking water sources at schools; continued work on a voluntary watershed management plan for the Cold River; completed outreach visits to the Acworth, Alstead, and Lempster Conservation Commissions regarding post-flood environmental issues and their water quality monitoring program; hosted a joint meeting with representatives from the Alstead Planning Board, Conservation Commission and Board of Selectmen regarding post-flood environmental issues; reviewed and commented on numerous river corridor rebuilding projects on a local and state level; and assisted the town of Alstead with the resolution of a Lake Warren water quality degradation issue.

Under the workshops, events and education category, the CRLAC participated in DES's May 2006 public informational session on post-flood environmental issues; presented *The Health of Our Streams and the October 2005 Flood* at the Alstead Primary School; provided watershed and water quality information at the Lake Warren Association annual meeting and the Connecticut River Joint Commissions' Wantastiquet Region meeting in April; completed the *Atlas of the Cold River and the Cold River Watershed* for public distribution; hosted two field trips to the flood-damaged areas and water quality monitoring sites for Leland and Gray eighth graders from Townsend, Vt.; presented *Water Resources in the Cold River Watershed* at St. John's Episcopal Church in Walpole; participated in interviews with local radio, newspaper, and television representatives about flood recovery; participated in the 2006 NH Watershed Conference and Alstead Festival; and assisted the Alstead Historical Society with the assembly of flood-related photos and a review of portions of *Too Much Water, Too Much Rain*, documenting the 2005 flood and its aftermath.

Under the water quality and quantity monitoring category the CRLAC completed the initial phase of their comprehensive surface water characterization program; prepared a summary of the successes and challenges of the monitoring program for the inaugural DES newsletter *Streamlines*; completed three "routine" and three additional water quality and stream stage monitoring events on the Cold River and its tributaries as part of DES's Volunteer River Assessment Program; added new sampling sites at Newell Pond, Warren Brook, and Dodge Brook; solicited and received DES funding for additional bacteria, nutrient, salt, and metal analyses; and represented the Cold River on the NH Stream Gauging Task Force in Concord.

The CRLAC consists of individuals nominated by the boards of selectmen from Acworth, Alstead, Langdon, Lempster and Walpole. The CRLAC supports municipal boards and is developing a Watershed Management Plan that will assist towns in managing water resources. The committee also reviews river corridor projects needing state and federal permits and investigates related issues of local or statewide significance.

The CRLAC welcomes participation on any of its projects. It meets on the third Thursday of each month from 7 to 9 p.m., usually in the Alstead town offices. The CRLAC is very grateful to Alstead for offering this meeting space. For more information, please visit its website at www.coldriver.org. To be included on their email notices for workshops or water quality monitoring events, please contact Debby Hinman, chair at (603) 835-2309 or dhinman@sover.net.

News from the West Coast of New Hampshire

Floods, fluvial geomorphology studies, and fish tissue toxins were among key topics of focus for the Connecticut River Joint Commissions (CRJC) in 2006.

The Cold River flood of the previous fall led to inquiries and lessons as we sought to understand the complex causes and long path to recovery of both the human and aquatic communities. We continued our fluvial geomorphology research and implementation in the river's upper watershed, installing a bioengineering project, riparian buffer, and planning for a conservation easement at the Colebrook Business Park.

Mercury, PCBs, and dioxins in Connecticut River fish remain a concern for both human consumption and for the food web linked to these fish, which once again includes the bald eagle. In the fall, EPA released the results of a study conducted in 2000 at CRJC's request. The results renewed our resolve to support state efforts to reduce mercury contamination of the environment and to urge effective mercury emission control on the federal level.

What we have learned from inquiries into floods, fluvial geomorphology, and fish tissue toxins have strengthened our belief in the value of riparian buffers in protecting wa-

Connecticut River, *continued on next page*

Connecticut River

continued from previous page

The Hanover High School girls' crew team on the Connecticut.

ter quality, reducing erosion, and mitigating the effects of floods. CRJC is gathering support for shoreland protection in Vermont, the only New England state without minimum shoreland standards, but with much more than 200 miles of that shoreland on the Connecticut River.

An important part of CRJC's program is the work of 75 town-appointed representatives to our five local river subcommittees. Each subcommittee is an active voice for river issues in its region. In 2006, they coordinated discussions between riverfront farmers and state dam managers about inundation warnings, provided advice on bridge, highway, and riverbank repairs, promoted local land conservation opportunities, and assisted town planning boards and conservation commissions. Understanding that the Connecticut River is the sum of its tributaries, the subcommittees met with watershed groups active on the tributaries in their regions to share ideas and concerns. Many members took to the field, surveying first and second order tributaries in their towns.

Updating the water resources chapter of our Connecticut River Management Plan has brought new issues before our subcommittees. While water quality concerns in our first plan focused on manure storage and erosion control, we are now exploring topics as diverse as salt contamination of groundwater, varves, and the need for new disposal guidelines for pharmaceuticals.

On the drawing board at CRJC is a new atlas of the Connecticut River Watershed in Vermont and New Hampshire, a joint project with Dartmouth College and Northern Cartographics, that will be published in both print and web versions. The atlas explores climate, physical geography, ecosystems, Native American heritage, settlement, agriculture, transportation, demographic and economic dynamics, issues such as flooding, riverbank restoration, water quality, and much more. Over 40 topics are being addressed by experts in the various fields.

Visit us on the web at www.crjc.org, and check out the Connecticut River Byway, now a nationally designated scenic byway, at www.ctrivertravel.net. New England's largest river is front and center.

~ Adair Mulligan, Conservation Director, CRJC

Dawn on the Exeter River

It all started with the eel.

When it came writhing out of the night water of a bog pond in Chester, my second thought – after first thinking how I was going to get it off my fishing line – was of the epic 40-mile journey it had made several years earlier as a 1-inch elver to reach this spot far from its origin in the Atlantic Ocean.

And so some years later on a spring flood, I made my own catadromous-like journey and in so doing discovered the Exeter River. Over the course of the next 20 years, I have made the trip several more times. I call it the "Chester-to-the-Sea" trip – the "sea" liberally defined as the salt water of Great Bay the river mingles with below the dam in downtown Exeter.

We leave at first light from a roadside in Chester and finish – sometimes in the dark – at Newfields, Adams Point, or Newmarket, depending how well we have judged the outgoing tide. We may portage as many as 20 times around dams and over blow-downs. We once estimated that we each dipped our kayak paddles 20,000 times over the course of the 12- to 14-hour trip. We start out bundled against the May morning chill, shed clothing in the midday warmth, then rebundled as the shoreside lights begin to twinkle.

Along the way, my companions and I see the best – and worst – of this coastal river that rises in a hillside seep in Chester and passes largely unnoticed through six towns. The best are the serpentine swamps in Fremont, where the river's course is often determined by gauging the bend of the submarine grass, and the fast run from Crawley Falls through Brentwood that leaves confetti curlicues of kayaks on the dark rapids. The worst are the insults wrought on the river by those who see it as a convenient sewer for their autumn leaf piles, tires and worse. Less obvious are the chemically grown lawns at the river's edge whose price for lushness is death by slow poisoning for the river.

Trout lily. Photo © by Janet Novak, Connecticut Botanical Society.

But we are optimistic. For each clear-cut shoreline there's a secluded river bend and we hope always that the latter outweighs the former. So each spring when the trout lilies bloom, we dip our paddles and head downstream hopeful that the river will be as we remember it. I like to think that as we paddle, we float above new elvers heading upstream toward a distant bog pond.

~ Greg Lowell, Exeter River LAC

News from the Contoocook and North Branch Rivers

Many of our rivers in New Hampshire are scenic and each has its unique aspects. The Contoocook River is unique as it flows north, (one of the longest north flowing rivers in the United States). It has played a very important part in the history of all our towns. Most of the 14 towns through which it passes were originally located along the river due to its value for water power by the early settlers. It also was used by Native Americans as well as by settlers due to its flow northwards across the state. (It flows from almost the Massachusetts border to Penacook, just north of Concord). Thus we have many dams along the river, some of which are still used for hydropower and industry today.

Last year we reported about the removal of one of the dams in West Henniker. Whitewater kayaking is common on the Henniker section of the river, during most of the year – sometimes it is almost to the point of creating traffic jams! This winter the warm weather has caused much of the river to remain open so that mergansers and other waterfowl have stayed in the area instead of migrating down to the coast. As spring is starting, we have enjoyed watching pairs of ducks each day along the river.

This year we have begun holding our regular monthly meetings at the Monadnock Paper Mills in Bennington, which own and operate three of the dams in the town of Bennington and which is close to the middle of our 72 mile long river. The paper mill has received a number of awards over the last few years for their environmental efforts, and they have helped us with copying, upgrading our exhibit (that some of you saw at the state-wide rivers conference last November), and provide the computer, PowerPoint, and VCR equipment needed for some of our meetings. Making connections with a number of different businesses located on our river has helped us also in raising the money needed to buy our own set of monitoring equipment. In turn, we have reduced the need for long drives when we previously shared the same set of apparatus borrowed from DES to sample all of our sites. (This is one of our local efforts towards dealing with global warming).

Monadnock Paper Mills in Bennington hosts the monthly CNBLAC meetings.

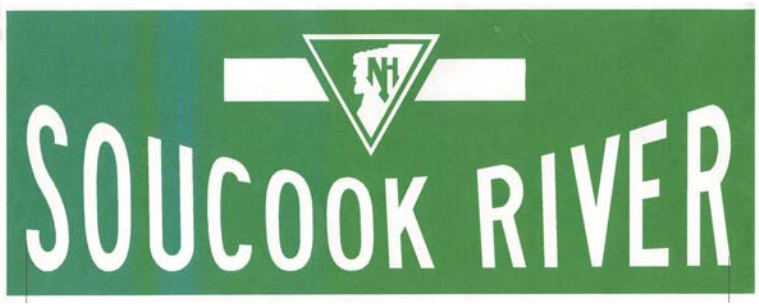
A new river trail was opened this year near the mill, which is a memorial to the late Bruce Edes, a former representative on the Contoocook and North Branch Rivers Local Advisory Committee from Bennington. We expect to explore this trail later this spring before one of our regular meetings. One of the joys of our monthly meetings is hearing the news from each town – there is always more to learn from each other each month.

So, what's new along your river?

~ Marian Baker, Secretary, Contoocook and North Branch Rivers LAC

A Sign of Distinction ...

"Primary" signs, such as the one below, are typically installed with NH Protected River signs. See page 10 for more on these signs of distinction.



Pemigewasset River Local Advisory Committee 2006 Report

The Pemigewasset River Local Advisory Committee (PRLAC) completed its fifth year of water quality testing last October. Eight test sites were monitored bi-weekly, six on the Pemigewasset, affectionately referred to as the Pemi, plus two tributaries (Smith and Mad River) encompassing towns from Bristol to Thornton. This test data now provides a solid information base from which to judge the future health of the river and its support systems. PRLAC currently monitors seven elements through the DES Volunteer River Assessment Program: temperature, dissolved oxygen, pH, specific conductance, turbidity; phosphorus and *E. coli*. PRLAC's preliminary conclusion is that all elements are within tolerance for Class B rivers except pH. 2006 readings indicate that the river is more acidic with pH readings approximately 5.8 vs. the standard 6.5-8.0 range. Initial speculation is that this could be due to elevated levels of precipitation throughout the summer of 2006. More troubling is the invasion of variable milfoil. There are serious infestations of milfoil from the Bristol-Bridgewater town line to below 10 Mile Brook. The source of the problem appears to be the Squam River. Amy Smagula, DES limnologist and Exotic Species Program coordinator, spent a day with PRLAC mapping the affected shoreland areas. PRLAC will be soliciting help with a plan to deal with the infestation.

A 24-member study commission was chartered by the state to review and recommend changes to RSA 483-B, the Comprehensive Shoreland Protection Act (CSPA), which controls development within 250 feet from public waters (lakes, rivers, ponds and coastal waters). The commission's final report was issued in November of 2006, and legislation associated with the recommendations has been introduced to the General Court. PRLAC made formal recommendations to the commission regarding the Pemi. Key elements of the proposed legislation are: 1) the Pemi and Saco Rivers would no longer be exempted from CSPA regulations; 2) the shoreland buffer area would be managed differently; 3) the provisions of the CSPA would be applied to third order rivers, (only fourth order and higher rivers are currently under the Act) thus adding 3,300 stream miles; and 4) a new provision would limit impervious surfaces in the protected shoreland. Max Stamp would be happy to provide more detailed information to anyone interested in the proposed changes to the CSPA. He can be reached at (603) 744-8223 or hmstamp@metrocast.net.

In 2007, in association with the Lakes Region Planning Commission and others, PRLAC will focus on developing criteria and a process for identifying conservation opportunities along the river corridor in anticipation of funds becoming available through the new In-Lieu Fee Program for wetlands mitigation. PRLAC will also focus its energies on organizing an effort to win approval of the CSPA revisions and identifying sections of the Pemi in need of erosion mitigation.

PRLAC meets on the last Tuesday of each month, January through November, at 7 p.m., in Boyd Hall, Plymouth State University. All are encouraged to attend.

Isinglass River LAC Update

The Isinglass River Local Advisory Committee (IRLAC) enjoyed considerable progress toward the creation of a river corridor management plan during 2006. With a good mixture of new and seasoned IRLAC members and the opportunity created by reduced development pressure in the Isinglass River corridor, the IRLAC was able to devote the majority of its time to the task of preparing for the development of its management plan. Building on the outreach work of previous years, the IRLAC worked with Strafford Regional Planning Commission (SRPC) to solicit 604(b) grant funding from DES for drafting its Isinglass River Management Plan. The IRLAC would like to thank DES for its support, and look forward to working with SRPC over the coming year.

The IRLAC continues to support volunteer water quality sampling along the Isinglass River, and is working to expand the program to include tributary sampling, and to bring in new volunteers. The IRLAC was also fortunate to have been chosen as one of the DES biological sampling sites. The members are excited about the growing availability of good data about the river, and are optimistic that their efforts will help riparian communities craft policies to help protect our river. As another outreach and education effort, committee members also worked with DES and the NH Department of Transportation to secure designated river signs for each of the major bridges across the Isinglass River in all three riparian communities, Strafford, Barrington and Rochester. IRLAC has received its signs and look forward to having them in place as soon as the weather permits. The committee feels that the new signs will help protect the Isinglass River and encourage good stewardship.

IRLAC anticipates a productive year in 2007, as it works with Strafford Regional Planning Commission to complete the various tasks outlined in the 604(b) grant proposal to craft its river management plan. It wishes to thank the many volunteers who participate in its programs, and encourages everyone to get out and enjoy the river. IRLAC is pleased that the river has remained one of the unspoiled gems of the Seacoast watershed.

~ Elizabeth Evans, Chair, Isinglass River LAC

The Lamprey River Advisory Committee Looks Back

The Lamprey River Advisory Committee (LRAC) celebrated their 10th year anniversary of federal Wild and Scenic River designation as a protected river for the portion of the Lamprey River from the confluence of the Lamprey and the Passaic Rivers in Newmarket, through Durham and Lee to the West Epping dam in Epping. In spite of a virtual downpour that lasted all day, more than 60 people braved the storm to celebrate at the Lee Grange Hall on November 12, 2006.

The LRAC was established with the approval of the river as it flows through Durham and Lee into the DES Rivers Management and Protection Program. Then, when the river was designated into the federal Wild and Scenic program, which includes the towns of Newmarket and Epping, the committee also became involved with that program. Both programs have helped protect the river.

Wild and Scenic status has afforded the river and nearby lands conservation protection and educational gains that could only have happened with the support of this federal program. For example, 19 properties totaling 1,044 acres and over seven and a half miles of river frontage have been conserved through the efforts of the LRAC and partnerships with other groups, towns, and state agencies. It has allowed the LRAC to leverage funds from other sources and magnify their own funding. Land protection continues to be one of their primary objectives, as they proceed into the next decade. Residents of the four towns who are interested in learning more about protecting their riverfront lands are urged to contact the LRAC. The LRAC can pay for most costs associated with easements. Please contact Kevin Martin, LRAC Chairman, at kmartin@ttlc.net for more information.

Representatives of American Rivers begin an exploration of the Lamprey River at Wadleigh Falls.

The LRAC is putting the final touches on an update for the committee's Lamprey River Management Plan, which will chart its course for the next few years. It is currently seeking comments and suggestions on the draft from interested landowners, organizations and the four towns, and will finalize the plan soon.

The LRAC has noted that there are only a few recreational access points to the Lamprey. The recreation subcommittee is working on a self-guided recreational tour that will include a map and guide with various types of access, ranging from walking or cross-country trails and canoe and kayak access, to kiosks with information on specific sections of the river. It is partnering with towns and other interested groups to make this tour a reality while working to protect sensitive areas. In addition, it has worked successfully with the town of Durham to create the new bridge at Packer's Falls with railings that highlight one of the most beautiful spots on the river.

The LRAC, as a part of its mandate, continues to review and comment on proposals that will affect the river. It is also contributing the committee's research and experience to the development of DES's Instream Flow study. The goal of this study is to protect the river's flow levels while accommodating public and private water needs.

Members of the committee continue to work with the Lamprey River Watershed Association in monitoring water quality of the river. The monitoring program now extends from Deerfield to the dam in Newmarket. Water quality remains generally high, thanks to effective land use regulations and land protection. Volunteer monitors are always needed, and it is an interesting way to become involved with river protection. Please contact Dawn Genes at dawn.genes@lrwa-nh.org for more information.

The outreach and education subcommittee has produced and is selling an exciting adventure tale of life on the Lamprey in the 1700s. *Peter Little Bear* is appropriate for both children and adults, and may be purchased at the town halls in the four towns and directly from the committee. Other educational materials include an entertaining video, *River Story: The Lamprey Through History,* and a curriculum that melds social studies with science activities for grades K-12. The LRAC also has pamphlets available that speak directly to landowners, as well as to the general public. All are available from the LRAC. Please contact Sharon Meeker, Chair, at smeeker@comcast.net for more information.

For more information about the LRAC, please go to www.decisionsciences.com/Lamprey_River.

~ Sharon Meeker, Vice-Chairman, Lamprey River LAC

Upper Merrimack's Successes and Recognitions for 2006

In 2006, the Upper Merrimack River Local Advisory Committee (UMRLAC) received two new exciting support opportunities. Adopt-a-River Site Sponsor, PSNH chose the UMRLAC as one of its "Power Play Partners." The Power Play Program provides cash donations from the PSNH to the UMRLAC when the Manchester Monarchs hockey team scores on a power play. The program also provides recognition of the UMRLAC including displaying its name on the Jumb-o-tron during games and information about it on team publications. The Concord Cooperative Market membership voted to invite the UMRLAC to participate in its Co-op Local Community Program. The UMRLAC will display information about its programs on the co-op's bulletin board and receive donations and other incentives through the community program. Thank you to the co-op and PSNH for their recognition and support of the UMRLAC!

The UMRLAC has been re-writing the Upper Merrimack Management Plan through a grant provided by DES to the Central NH Regional Planning Commission (CNHRPC). The CNHRPC has sub-contracted to Vanasse Hangen Brustlin Inc. who is working with the UMRLAC to provide technical support and facilitation for the project. The new plan will address emerging issues in the Upper Merrimack and provide vision, guidance, and watershed management recommendations for state agencies and municipalities. The draft includes logic model measurable outcome sections on water quality, water quantity, agriculture, recreation, wildlife, historical and archeological, geologic and natural features, fish and aquatic vegetation, buffers and setbacks, and land and open space. The "first look" public session was held in February 2007 to gain input from municipalities and watershed residents.

UMRLAC is proud to continue its work on the eleventh year of the Upper Merrimack Monitoring Program (UMMP). The UMMP owes much of its success to strong municipal support and from its Adopt-a-River Site Sponsors. The Program's Adopt-a-River Site Sponsors include Aquarian Analytical Laboratories, Inc.; Aries Engineering, Inc.; Checkmate Expert Payroll Services; Elektrisola; Franklin Savings Bank; Franklin Wastewater Treatment Facility; PSNH corporate offices and Merrimack Station; and Watts Regulator/Webster Valve. Many thanks to the conservation commissions and towns and cities of Boscawen, Bow, Canterbury, Concord, Franklin and Northfield for their ongoing support and for graciously hosting Upper Merrimack River Local Advisory Committee meetings. This support has enabled the UMMP to expand its work including purchasing additional dissecting microscopes for use during Bug Nights.

For over ten years, the Franklin Wastewater Treatment Facility provided *E. coli* sample processing for the UMMP with the assistance of over a dozen collection volunteers. The data are the first volunteer monitoring program's to be entered into the DES Environmental Monitoring Database. This bacteria sampling has led to the identification and elimination of several illicit discharges in the Franklin area. Illicit discharges are connections of sewage lines to stormwater pipes and result in the release of untreated sewage into the Merrimack River and its tributaries. Upper Merrimack Monitoring Program sampling identified several high bacteria occurrences that it reported to DES who performed investigations and worked with the city of Franklin to remove these discharges.

In 2006, the Franklin Wastewater Treatment Facility, an UMMP sponsor, was recognized by the US Environmental Protection Agency with the National First Place Award for Operations and Maintenance Excellence. Congratulations to the facility for its innovation and conscientious operation that does all that it can do to keep the Merrimack River as clean as possible.

Bug Nights continues its popularity in the region, in special thanks to the St. Paul's School, for hosting the event. Bug Nights is entering its 11th year in 2007 with over 60 individuals volunteering their collection and identification services. The UMRLAC has mapped a ten-year data analysis and report of the UMMP along with a retrospective of the program. This analysis will guide planning efforts for the next decade.

The UMRLAC is grateful for the support of its sponsors, partners and municipalities of the Upper Merrimack Monitoring Program and other projects in the watershed.

Steve Landry continued to represent the UMRLAC and several other southern New Hampshire local river management advisory committees on the NH Department of Transportation's Community Technical Assistance Program (known as CTAP). The CTAP is working to find community solutions in response to the I-93 widening. In November of 2006, Michele Tremblay gave a presentation about the UMRLAC's experience with entering and accessing data through the DES Environmental Monitoring Database at the Watershed Conference. Tucker Noack, Franklin representative, presented information to the City Council about the UMRLAC and the UMMP.

The UMRLAC continued to review

Upper Merrimack,
continued on page 18

Lower Merrimack River Local Advisory Committee Update

In 2006, the Nashua Regional Planning Commission (NRPC) was awarded a $15,000 604(b) grant to conduct a survey of Lower Merrimack corridor residents regarding their perceptions and rankings of river related issues. Bob Robbins, chair of the Lower Merrimack River Local Advisory Committee (LMRLAC) participated in his employer-sponsored matching program that provided additional funding for the survey. As an incentive to fill out the survey, participants were entered into a drawing to win a $50 gift certificate to a local restaurant. The landowner survey produced over 250 responses out of 1,600 sent, with over 100 providing contact information. It was decided to create an email newsletter to let people know about various LMRLAC sponsored activities. LMRLAC created a press release for the Nashua *Telegraph* with a photo of the landowner survey gift certificate presentation.

The LMRLAC is also working with NRPC to update its Corridor Management Plan. Responses from the survey will be incorporated into the corridor plan. In the summer of 2006, the LMRLAC arranged site tours with the NRPC planner to the significant riverfront points of interest in each of the corridor communities. In June of 2006, riverfront tours took place in Litchfield and Nashua. Hudson was visited in July and Merrimack in August. Highlights of the tours included access points, parks, trails, open space, conservation land, river views, wildlife habitat, historical points of interest, and erosion problems. This information will become an integral part of the corridor plan, which the LMRLAC and NRPC will be busy developing in 2007. The goal is to finish the plan in June of 2007, stay tuned by visiting their website at www.nashuarpc.org/envplanning/lmrlac.htm!

~ Kathryn Nelson, Vice Chair, Lower Merrimack River LAC

A Debate Coming to a Town Near You!

The Piscataquog River Local Advisory Committee (PRLAC) was created pursuant to RSA 483, and is comprised of volunteers dedicated to protecting the health of the river and its use by the people of New Hampshire. As advocates for the river, the PRLAC looks to educate itself and others about issues regarding the river's health. In 2006 we undertook to learn more about the issue of biosolids-spreading adjacent to the river, an echo of a debate going on in the state house in 2005 and 2006. This article is to inform others of our experience so they may be prepared to participate in the debate when (not if) it comes their way.

There are powerful advocates on both sides of the debate. One side can be characterized as environmental activists concerned about the long-term effects of biosolids-spreading on ground water and vegetation retention of materials, with an ultimate absorption by animals and humans. On the other side are commercial private sector and public sector operators who process waste and, after significant treatment and testing, use the resultant solids in various ways as fertilizers.

What we learned about the debate regarding the safe use of biosolids resulting from waste processing is – there is a debate! We took the approach that, when faced with such uncertainty, we should err to the side of protecting the river and human health. We solicited signatures for a petition article calling for a complete ban of the spreading of biosolids in the town of Weare. Understandably, that resulted in another petition article from the advocates of biosolids use calling for the town of Weare to simply adopt state regulations. We will spare you all the details of the resulting debate but there were many points and counterpoints all the way to Weare's deliberative session.

Ultimately, we compromised with the proponents of the other article and combined the two articles in to one that simply proposed a Weare ordinance echoing the state's protective 250-foot setback from the river itself. Though there is no additional protection than what the state regulation provides, the process introduced the issue to the town selectmen, conservation commission and deliberative session attendees. The article was soundly endorsed by the voters in March, giving Weare its own biosolids regulation and thereby insuring some river protection regardless of what the state does.

We urge others to have this discussion in their municipality. The debate goes on. We hope you become a part of it.

~ Dick Ludders, Acting Chair, Piscataquog River LAC

The Souhegan Flows On

2006 has been an important year for the Souhegan River. Local planning boards, conservation commissions, and developers have worked with the Souhegan River Local Advisory Committee (SoRLAC) to seek its input on projects and improvements within the Souhegan watershed. While working with various stakeholders on these projects, SoRLAC has taken the opportunity to promote the use of new methodologies and technology that have the least possible impact on the shoreland and river.

Removal of the Merrimack Village Dam is proposed to happen in 2008.

The Souhegan was one of the first designated rivers to take advantage of the protected river sign program. The Souhegan received limited funding from DES and secured remaining funds from the Wilton Conservation Commission, the Milford Conservation Commission, and the town of Greenville to purchase signs for all bridge crossings, with the exception of the interstate highway. The signs identify the river and note that it is a NH Protected River. The SoRLAC has installed the majority of the signs, with just a few more to go!

The Merrimack Village Dam, located in Merrimack, is the first dam on the Souhegan River. The dam is owned by Pennichuck Water Works (PWW) , who purchased the dam in 1964. PWW approached DES to determine its options in either removing the dam or transferring its ownership to another entity. After holding several Merrimack town meetings, the Merrimack Board of Selectmen established a subcommittee to pursue issues related to dam removal and river restoration. A study plan was developed to identify studies needed to evaluate the impacts dam removal could have on infrastructure, sediment, pollutants, fisheries, wetlands, and property. Findings indicate that the removal of the spillway and apron (the dam abutments, canal wall, and gate structure would remain) would restore diadromous fish passage to 14 miles of river habitat; improve water quality; restore natural sediment transport; reduce flood impacts; increase recreational use; and eliminate long-term operation, maintenance, liability and dam repairs. The dam has been determined eligible for the National Register of Historic Places and the owner and project partners are working with the NH Division of Historic Resources to develop a memorandum of agreement that will entail mitigation for the removal, however the specifics are not finalized at this time. The dam is proposed for removal in 2008.

The Souhegan River is one of two New Hampshire rivers being studied for the Instream Flow Pilot Project, which is one of the components of the DES Rivers Management and Protection Program. The University of New Hampshire, University of Massachusetts and Normandeau Association Inc. have developed the *Souhegan Protected Instream Flow Report*, which will be used by the Technical Review Committee as well as input from public hearings to establish protected instream flows for the Souhegan. A copy of the *Souhegan Protected Instream Flow Report* can be found on-line at www.unh.edu/erg/souhegan/pisf_feb_07/executive_summary.pdf. SoRLAC is excited to take part in this opportunity.

SoRLAC is also proud to announce the completion of their management plan! The *Souhegan River Watershed Management Plan* is available on on-line at www.nashuarpc.org/envplanning/documents/souheganwatershedmgmtplan.pdf.

~ George May, Chair, Souhegan River Local Advisory Committee

Upper Merrimack

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and provide comment on project plans and proposals including the re-licensing application for several hydroelectric facilities on the Merrimack River, and site specific and wetlands applications at the Society for the Protection of New Hampshire Forests, Concord; Sky Meadow subdivision, Franklin; Oxbow Bluff subdivision and Manor Road subdivisions, Concord; West Road stabilization, Canterbury; and the existing and proposed landfills, Franklin and Canterbury, respectively. At the request of the NH Rivers Management Advisory Committee, the UMRLAC reviewed a surplus land disposal proposal in Franklin. The UMRLAC will also be involved in the Concord coal tar dump application review.

Please visit UMRLAC's website at www.merrimackriver.org for further information on the river, committee membership, activities, maps, water quality data, and photographs of brave and selfless volunteers in action. The UMRLAC meetings are held on a rotating basis in its six represented communities on the second Monday of each month at 7 p.m. All are welcome to attend. For meeting schedules, locations, and other information contact Michele Tremblay at (603) 796-2615 or mlt@naturesource.net.

~ Michele L. Tremblay, Chair, Upper Merrimack River LAC

The Kancamagus Highway Improvement Project:
A Model for Successful Local Advisory Committee Involvement

The year was 1999. The location was the Kancamagus Scenic Highway (Route 112) on the White Mountain National Forest, which runs parallel to the Swift River for over 15 miles. For much of that distance, the road is perched within 25-50 feet of the river.

In its effort to complete a major road improvement project on "The Kanc," the New Hampshire Department of Transportation failed to involve the Swift River Local Advisory Committee (SRLAC) during project planning. Consequently, when ledge blasting was required to widen the corridor, no mitigation was provided. Tons of shot rock were hurled into the river before the committee intervened. The scene that followed was not pretty. In the end, the damage was already done, and the project had to be delayed many weeks to correct problems.

The rock wall at left was the result of public input, which has helped to improve aesthetics along the Swift River.

Fast forward to the years 2005-2006.

DOT was planning the next phase of road improvements on a different section of the Kancamagus Highway.

This time, DOT contacted potential affected parties early in their planning process, including the SRLAC, the town of Albany Selectmen, and the White Mountain National Forest. DOT engineers made every effort to seek ideas and suggestions from the SRLAC, meeting with members on no less than three separate occasions, including a final public meeting at the Albany Town Hall. Input was sought on factors ranging from retaining wall design to road runoff retention to culvert design.

As a result, when work began the results this time were stunningly different.

- The original plan called for a significant amount of retaining walls abutting the river to accommodate a greater road width. The DOT engineers after consulting with the public worked to reduce that to one 300-foot section, and that was installed with minimum impact to the riverbanks and riparian vegetation. Rather than leaving a concrete wall, a simulated rock-wall facing was applied to improve aesthetics.
- Though less rock blasting was necessary, this time the use of interlocked rubber-tire blast "blankets" eliminated any chance of rocks flying into the river.
- The SRLAC was consulted for feedback on the many tributaries draining under the road and into the river. After discussion with committee members (including Frank Wolfe) and the Forest Service, DOT project foreman Jack Smith suggested a creative design to position the outlet ends of culvert pipes, to allow water to percolate into the river through a riparian buffer, rather than a vertical drop. The road contractors, supervised by Smith, went to extra efforts to recreate a natural rock streambed in a way that will allow riparian vegetation to reestablish quickly and create a more natural appearance.

SRLAC Chairman Bob Parrish and other committee members applaud the efforts of DOT officials including project leader Mike Fudala, design engineer Toby Reynolds, and environmental coordinator Kevin Nyhan. Bob Parrish said, "To their credit, the DOT went out of their way to involve people, and showed real dedication to protecting the integrity of the Swift River ecosystem."

Consultation with SRLAC created a more natural culvert design.

The recent Kancamagus project serves as an excellent example of how, through cooperation, local advisory committees and government agencies can work together to improve projects and protect our environment.

~ Terry Miller, Vice-Chairman, Swift River LAC

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Guidelines

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The *White Paper* succinctly provides the scientific background that supports a fluvial geomorphologic approach to river restoration and also the basic background needed to understand how to work with rivers' natural processes.

The electronic library contains all the scientific and guidance documents referenced in the *Guidelines* and the *White Paper*. This library is the first compilation of its type and provides resource documents by federal, state, and non-governmental organization practitioners and is organized in the following categories: bank stabilization, naturalized channel design, useful project technical information, roadways and river corridors, monitoring, and qualitative reports and policy papers.

These resources will be a valuable tool in rivers management now and for years to come. To use, please go online at www.des.nh.gov/rivers/guidelines_naturaldesign.htm.

~ Laura Hayes, RMPP Assistant Planner

RMAC

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term, multi-purpose New Hampshire Stream Gage Network. The report is available on-line at www.des.nh.gov/Rivers/rmac/documents/sgtf/20060915SGRF_Report.pdf.

In 2006, as part of its duties under RSA 483:8 VI and RSA 183:14, the RMAC reviewed nine proposed state surplus land disposals. The RMAC recommended disposal on five of the nine properties. The RMAC has not made a determination on the remaining four, due to insufficient information. In order to improve efficiency in the review process the RMAC and DES signed a memorandum of agreement with DOT to establish procedures for the inter-agency review of state surplus land that were purchased with state or federal highway funds. The RMAC has expressed its concerns regarding the state's present process pertaining to the disposal of surplus waterfront land to Gov. Lynch. Members from the RMAC and the Lakes Management Advisory Committee met with Gov. Lynch in September of 2006 to proactively address this issue.

~ Kenneth Kimball, Chair, and Michele L. Tremblay, Vice Chair, Rivers Management Advisory Committee